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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,154	03/24/2005	Yoshihisa Umeno	10873.1582USWO	1870
52835 7590 08/12/2010 HAMRE, SCHUMANN, MUELLER & LARSON, P.C. P.O. BOX 2902 MINNEAPOLIS, MN 55402-0902				
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08/12/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,154

Applicant(s)

UMENO, YOSHIHISA

Examiner

Filip Zec

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI.08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Interval Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/6/2010 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection. Claim 1 is rejected under 103(a) over U.S. Patent 5,987,904 to Kim et al. in view of U.S. Patent 2,747,391 to Lazar and U.S. Patent 6,619,045 to Clark.

Claim Objections

3. Claims 1-10 are objected to because of the following informalities: claim 1 recites the limitation "an open space" in lines 12-13, for which the antecedent basis have been established in line 10; thus the limitation should read - - the open space - -. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3 and 5, 6, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,987,904 to Kim et al. (Kim) in view of U.S. Patent 2,747,391 to Lazar (Lazar) and U.S. Patent 6,619,045 to Clark (Clark).

In reference to claim 1, Kim teaches a cooling device (FIG. 2) comprising a cooler (11, FIG. 2) provided on at least one side-wall side (G, FIG. A, as annotated by the Examiner) formed with a thermal insulating box (inherent in a freezer construction as shown in Kim, see FIG. 2); a cooling chamber (F, FIG. A) in front of the cooler (11, FIG. 2); and a fan (20, FIG. 2) that allows air in the cooling chamber to flow, wherein the cooler and the cooling chamber are partitioned by a partition (C, FIG. A) so as to allow cold air to be accumulated in the cooler, the fan (20, FIG. 2) is disposed on a side of the cooler (11, FIG. 2) relative to the partition (C, FIG. A), the partition in front of the fan (20, FIG. 2) has an aperture (D, FIG. A) formed in a flat sheet portion (above and below partition C, FIG. A), an open space is formed between the fan and the flat sheet portion in which the aperture is formed (see FIG. 2), cold air accumulated in a space inside the partition, and hot air in the cooling chamber are exchanged by the fan (20, FIG. 2) through the aperture (D, FIG. A), wherein the rotation of the fan generates a discharged flow of cold air discharged from the cooler to the cooling chamber through the aperture and a sucked flow of cold air sucked from the cooling chamber to the cooler through the aperture, and the discharged flow and the sucked flow directed from the cooling chamber to the cooler collide with each other in a portion in which the aperture is provided (inherent in the structure as described in Kim, see FIG. 2), but does not teach that the perimeter of the fan is not surrounded by a cylindrical component, and the open space is formed outside the fan in the radial direction. Lazar teaches a forced convection evaporator (FIG. 3) wherein a fan (58, FIG. 3) is located inside the casing (2,

FIG. 3) and wherein said fan is not surrounded by a surrounding component and having an open space outside said fan in the radial direction (FIG. 3 and FIG. 4) in order to allow the fan to suck the cooled air from entire space inside of the casing, including the bottom area of the casing (where the evaporator 28 is located) and disperse said area in the opposite direction towards the discharge (66, FIG. 2 and 4) and thus increasing the efficiency of the refrigerating system (col 2, lines 40-45). Additionally, Clark teaches that is well known that the mixing of various velocity airflows produces a turbulence that leads to improved overall distribution of the cold air thus improving the overall cooling efficiency (col 1, lines 42-45). It is inherent in the structure of Lazar and Kim, which teaches the empty space around and in front of the fan, having said fan to allow for mixing of air flows of different velocities, thus improving the overall cooling efficiency.

Therefore, it would thus have been obvious to one of ordinary skill in the art at the time of the invention was made to additionally modify Kim, by having a fan located inside the casing, wherein said fan is not surrounded by a surrounding component and having an open space outside said fan in the radial direction, as taught by Lazar, in order to allow the fan to suck the cooled air from entire space inside of the casing, including the bottom area of the casing (where the evaporator is located) and disperse said area in the opposite direction towards the discharge and thus increase the efficiency of the refrigerating system and to mix various velocity airflows, as taught by Clark, in order to produces a turbulence that leads to improved overall distribution of the cold air thus improving the overall cooling efficiency.

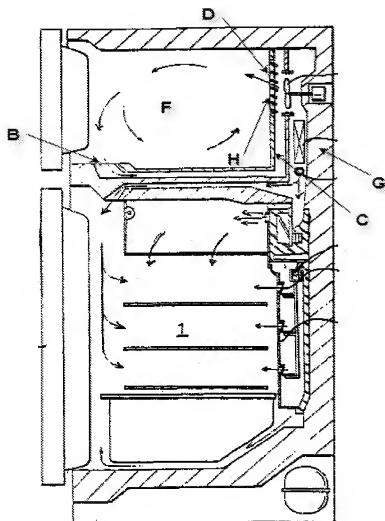


FIG. A, as annotated by the Examiner: A Cooling Device

In reference to claim 2, Kim, Lazar and Clark disclose the cooling device as explained in the rejection of claim 1, and Kim also teaches that dimensions of the aperture (D, FIG. A) are larger than a diameter of the fan (20, FIG. 2).

In reference to claim 3, Kim, Lazar and Clark disclose the cooling device as explained in the rejection of claim 2, and Kim also teaches that when viewing the fan (20, FIG. 2) in a

direction of a rotation shaft of the fan, the fan is disposed in the aperture (D, FIG. A) and there is an open space outside the fan (in front and around of fan 20, FIG. 2).

In reference to claim 5, Kim, Lazar and Clark disclose the cooling device as explained in the rejection of claim 1, and Kim also teaches that the discharged airflow and the sucked flow collide with each other, thus suppressing the flow speed of the cold air (inherent in the structure as described in Kim, see FIG. 2 and FIG. A).

In reference to claim 6, Kim, Lazar and Clark disclose the cooling device as explained in the rejection of claim 1, and Kim also teaches that the fan (20, FIG. 2) is disposed above the cooler (11, FIG. 2).

In reference to claim 8, Kim, Lazar and Clark disclose the cooling device as explained in the rejection of claim 1, and Kim also teaches that a slit (B, FIG. A) is formed in the partition (C, FIG. A) at a portion below the cooler (11, FIG. 2).

In reference to claim 10, Kim, Lazar and Clark disclose the cooling device as explained in the rejection of claim 1, and Kim also teaches that a safety cover (grille H, FIG. A) is disposed over the fan aperture (D, FIG. A).

6. Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Lazar and Clark as applied to claim 1 above, and further in view of U.S. Patent 4,420,679 to Howe (Howe).

In reference to claims 7 and 9, Kim, Lazar and Clark disclose the cooling device as explained in the rejection of claim 1, but do not explicitly teach that a fan application with an area of the aperture S and a diameter of the fan R satisfies a plurality of combinations, including the following relationship

$$1.5 \times \pi(R/2)^2 \leq S \leq 2 \times \pi(R/2)^2$$

Howe teaches (FIG. 3) that the aperture diameter is approximately twice the length of the fan sweep diameter, and therefore, meets the limitation criteria in order to advantageously create a more subtle temperature gradient throughout the chamber by way of enhanced mixing, and thereby, providing a more predictable environment within the enclosure for more predictable results

Therefore, it would thus have been obvious to one of ordinary skill in the art at the time of the invention was made to additionally modify Kim, Lazar and Clark by proportioning the fan to aperture ratio in accordance with

$$1.5 \times \pi(R/2)^2 \leq S \leq 2 \times \pi(R/2)^2$$

as taught by Howe in order to advantageously create a more subtle temperature gradient throughout the chamber by way of enhanced mixing, and thereby, providing a more predictable environment within the enclosure for more predictable results. It would have been further obvious to one of ordinary skill in the art at the time of the invention was made to modify the apparatus of Kim, Lazar and Clark with an oversized fan aperture with a plurality of proportions with said range in order to advantageously create a customized flow pattern, and thereby, further satisfying designers criteria to afford better results.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,076,070 to Takushima et al. teaches a fan device for refrigerator.

U.S. Patent 5,775,125 to Sakai et al. teaches an integrated air conditioner.

U.S. Patent 6,029,470 to Joo et al. teaches a refrigerator with cool air dispersing blades.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Filip Zec whose telephone number is 571-270-5846. The examiner can normally be reached on Monday-Friday, from 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisors, Frantz Jules or Cheryl Tyler can be reached on 571-272-6681 or 571-272-4834, respectively. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/FZ/

/WILLIAM E. TAPOLCAI/
Primary Examiner, Art Unit 3744

8/10/2010